



Making a positive difference
for energy consumers

Greenlink Interconnector Limited
and stakeholders

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Date: 31 March 2021

Dear stakeholders,

Decision on our needs case review of the Greenlink interconnector

The purpose of this letter is to inform Greenlink Interconnector Limited (GIL) and wider stakeholders of the outcome of our decision to revisit aspects of the needs case for the Greenlink interconnector. Following our review of the socio-economic benefits and wider impacts of Greenlink, we have concluded that Greenlink is likely still in the interest of current and future GB consumers. Greenlink will therefore retain its cap and floor regime in principle.

In addition, following this assessment, we have decided to amend the IPA condition for Greenlink related to the duration of delay to the project's connection date which we would deem material. We have decided to extend this period by a further two years.

Background and context

The cap and floor regime provides interconnector developers with consumer underwriting at the floor; it is therefore important that we ensure that those projects awarded a cap and floor regime are likely to provide benefits for current and future GB consumers.

At the Initial Project Assessment (IPA) stage for cap and floor Window 1 interconnectors in 2015 we assessed the potential impacts of Greenlink, amongst other applicants, on electricity markets and cross-border trade, on the GB electricity network, and in line with long-term strategic and sustainability indicators. Our initial assessment suggested that Greenlink was unlikely to deliver benefits for GB consumers based on the information

available. In our March 2015 consultation¹ we therefore sought views on our minded-to position to not grant Greenlink a cap and floor regime. We consulted again in August 2015 on an updated IPA analysis for Greenlink². In our September 2015 decision letter³ we subsequently awarded Greenlink a cap and floor regime in principle.

In our September 2015 decision letter for Greenlink we specified that our decision was *"contingent on progress generally in line with the timelines, cost estimates and commercial arrangements provided in the project submissions"*. Where information submitted to us before the FPA decision indicates that these conditions are not met, we advised that we may choose to revisit the analysis and outcome of the IPA *"in order to confirm whether or not the project continues to be in consumers' interests and should continue to be granted a cap and floor arrangement."* The IPA conditions put in place for Greenlink were consistent with other Window 1 interconnectors, but also included some Greenlink specific conditions related to their project-specific circumstances.

In August 2020 we notified GIL that one of these conditions had not been met; specifically we had come to a view that the costs submitted at the Final Project Assessment (FPA) stage had risen materially from the cost estimates submitted at the IPA stage. We subsequently decided it was appropriate to revisit aspects of the needs case for Greenlink.

Basis of our decision to revisit the needs case

In our September 2015 decision letter we noted that: *"For cost estimates, the condition is that the costs submitted by the project developers do not materially rise. [...] We will consider the threshold of materiality of any cost escalation against the potential impact on the needs case and consumer benefits and comparable costs for similar projects."* We decided that the costs submitted to us at FPA stage had increased materially, and that it was appropriate to use our discretion under the IPA conditions to revisit aspects of the needs case in order to confirm the project was still likely to be in consumers' interests.

¹ Cap and floor regime: Initial Project Assessment for the FAB Link, IFA2, Viking Link and Greenlink interconnectors - <https://www.ofgem.gov.uk/publications-and-updates/cap-and-floor-regime-initial-project-assessment-fab-link-ifa2-viking-link-and-greenlink-interconnectors>

² Cap and floor regime: Update on our Initial Project Assessment of the Greenlink interconnector - <https://www.ofgem.gov.uk/publications-and-updates/cap-and-floor-regime-update-our-initial-project-assessment-greenlink-interconnector>

³ Decision on the Initial Project Assessment of the Greenlink interconnector - <https://www.ofgem.gov.uk/publications-and-updates/decision-initial-project-assessment-greenlink-interconnector>

In a Window 1 update letter published in October 2018⁴ we agreed to conduct a phased FPA process for Greenlink, under which the information that we required Greenlink to submit for our FPA was provided in three main stages.

- At stage 1, which was submitted in September 2018, Greenlink’s FPA submission primarily provided qualitative and contextual information, including an overview of key technical and regulatory updates since Greenlink’s IPA submission. Stage 1 also included an early view on how the project’s costs were expected to change since the IPA.
- Stage 2 was submitted in July 2019 after Greenlink had received and analysed its initial tender returns. At this stage of our FPA, we identified that costs had increased since GIL’s IPA submission to us. However, as the project was in the early stages of its main procurement process, GIL was confident that we would see cost decreases between the stage 2 submission and the stage 3 submission, mainly due to the competitive nature of the procurement process.
- Stage 3 was submitted to us in April 2020 and following further analysis GIL provided us with an updated cost submission in August 2020. It is on the basis of the August 2020 submission that we made our decision to revisit the needs case for Greenlink.

We determined that development and capital costs (devex and capex) had increased 13% and post-construction costs had increased 115% between the IPA and final FPA stage.

Table 1: Summary of costs submitted by GIL (£m, Dec 2020 prices)

Cost type	GIL IPA submission	GIL FPA submission	Percentage change
Devex and capex	364	413	+13%
Opex*	135	291	+115%

* operating costs here do not include replacement costs.

We tested this cost escalation against the threshold of materiality considerations set out in the relevant IPA condition and on balance of these factors we considered that Greenlink’s costs had risen materially.

⁴ Cap and floor regime: Update on the Final Project Assessment stage for Window 1 interconnectors - <https://www.ofgem.gov.uk/publications-and-updates/cap-and-floor-regime-update-final-project-assessment-stage-window-1-interconnectors>

- *Impact on needs case and consumer benefits* – At IPA stage Greenlink was the most marginal, in terms of consumer welfare, of the projects assessed in our Window 1. As a result we considered that cost escalations for Greenlink are more likely to impact the socio-economic needs case.
- *Comparable costs for similar projects* – The project costs for Greenlink submitted at FPA stage in August 2020 are reasonable and comparable when benchmarked against other interconnectors.

Based on the factors noted above, our threshold of materiality for cost escalation is determined on a project-by-project basis. Our determination of the materiality of cost escalation for Greenlink should not, therefore, be considered the threshold of materiality for future projects.

We separately concluded that given the marginal nature of the basis of Greenlink's needs case determined at IPA stage and the relative significance of cost escalation, it was appropriate to use our discretion under the IPA conditions to revisit aspects of the needs case for Greenlink. Specifically, we decided to update our socio-economic modelling exercise as this was the aspect of the needs case most directly impacted by cost escalation.

Approach to the needs case review

At IPA stage our decision to award Greenlink a cap and floor regime in principle was based on an assessment of the potential impacts of Greenlink on electricity markets and cross-border trade, on the GB electricity network, and in line with long-term strategic and sustainability indicators. Specifically for Greenlink we noted the long-term strategic value of the project in balancing intermittent renewables output and maximising the efficient use of renewable resources.

For the purposes of this needs case review we decided that it was appropriate to focus on the impact of Greenlink on electricity markets and cross-border trade using updated socio-economic modelling. For consistency we considered it important that the modelling methodology should mirror, as far as possible, the modelling performed in the IPA analysis. This means:

- *Using a scenarios and sensitivities to test a range of possible future outcomes* - We decided to use three updated scenarios that represent base, high, and low interconnector value cases consistent with the approach to scenarios at IPA stage. We also chose to base these scenarios as far as possible on publicly available data;

specifically the National Grid Future Energy Scenarios (FES), ENSTO-E Ten Year Network Development Plan (TYNDP) scenarios, and BEIS fuel and carbon price forecasts. We consulted with Greenlink, and other parties as relevant, and subsequently created an additional Net Zero scenario which reflected latest decarbonisation ambitions in connecting countries, and a new sensitivity to test a future where decarbonisation ambition is more balanced between GB and the connecting countries.

- *Using the latest available project information* – We used the latest cost information submitted by Greenlink as the basis of inputs into the model. For both costs and other project information, such as the connection date, we have consulted with Greenlink. For other projects, including those in the baseline, we have used our latest positions.

For detailed information on the modelling approach please see the independent CBA reports from AFRY Management Consultants (then Poyry) for our cap and floor Window 1⁵ and Window 2⁶ modelling.

In addition to the socio-economic modelling we felt it was appropriate to consider the wider impacts of interconnection that are not captured in that exercise. We therefore invited GIL to provide evidence of the wider benefits of Greenlink beyond those captured in our socio-economic modelling to take into account alongside our internal analysis. GIL submitted their view of the wider qualitative benefits of Greenlink in October 2020, and a further statement summarising their view of the wider quantitative benefits of Greenlink in February 2021. Evidence from these submissions was considered in our decision-making process.

Result of the needs case review

Our updated modelling suggests that there has been a shift in the likely allocation of socio-economic welfare benefits since the IPA for Greenlink.

At the IPA stage Greenlink was modelled to deliver positive GB total welfare in the base and high scenarios, and similarly positive GB consumer welfare in the base and high scenarios. Both GB total welfare and GB consumer welfare were negative in the low case. Producer welfare inversely mirrored GB total and consumer welfare figures.

⁵ Near-term interconnector cost-benefit analysis: independent report (Cap & Floor Window 1) - https://www.ofgem.gov.uk/sites/default/files/docs/2015/03/791_ic_cba_independentreport_final.pdf

⁶ Near-term interconnector cost-benefit analysis: independent report (Cap & Floor Window 2) - https://www.ofgem.gov.uk/system/files/docs/2018/01/near-term_interconnector_cost_and_benefit_analysis_-_independent_report_.pdf

Table 2: Impacts of Greenlink on GB in our August 2015 consultation on an updated IPA assessment for Greenlink (£m NPV, 2013 prices)

Welfare category	Base Case	Low Case	High Case
GB consumer welfare	183	-285	452
GB producer welfare	-151	160	-241
GB interconnector welfare	65	-17	95
GB total welfare	96	-143	306

Interpretation of our updated modelling for Greenlink is more nuanced due to the inclusion of an additional Net-Zero scenario and a Rebalanced Ambition sensitivity which fall outside of the linear progression of low, base, and high case scenarios of interconnector value. In our updated modelling Greenlink is modelled to deliver positive total welfare across all scenarios, when taking into consideration both GB and the all-Ireland electricity market. Socio-economic GB welfare is positive in the Net Zero scenario as well as in the high and base case scenarios, although marginally in the latter two cases. GB consumer benefits are only positive in the high case, and GB producer welfare is only negative in the high case. Since our IPA stage, the socio-economic welfare benefits from Greenlink appear to have broadly shifted from consumers to producers, with benefits accrued at a total GB level being more nuanced depending on the scenario.

Table 3: Updated economic welfare analysis for Greenlink (£m NPV, 2020 prices)

Welfare category	High Case	Base Case	Low Case	Rebalanced Ambition	Net-Zero
GB consumer welfare	538	-828	-370	-452	-171
GB producer welfare	-241	1030	318	347	698
GB interconnector welfare	-288	-163	-263	-82	-173
GB total welfare *	9	38	-315	-187	355
Total welfare**	1560	1017	81	608	1975

* GB welfare is the sum of consumer, producer, and interconnector welfare.

** Total welfare is the sum of GB welfare and the equivalent welfare figure in the connecting country.

It is our view that the changes in welfare allocation since the IPA are driven largely by changes in the energy landscape as reflected in the updated scenarios. The level of ambition with respect to decarbonisation is greatly increased, most notably in GB with the legally binding net-zero target. In order to meet this target, our updated scenarios deploy

significant renewable growth alongside new technology such as carbon capture and storage. As renewable penetration begins to dominate the GB energy mix in our scenarios, the wholesale price of electricity in GB falls in our modelling. This means that Greenlink is modelled now primarily as an export cable on day-ahead timeframes. When interconnectors export from GB, this increases GB wholesale prices which explains the shift in allocation of benefits from consumers to producers.

The effect of the increased costs for Greenlink, which are the driver of this re-assessment, are captured in our modelling through the setting of cap and floor levels. Across all scenarios, except the low case, our modelling predicts that interconnector revenues fall close to floor in the very early years of operation but fall close to, or exceed, the cap from 2030 onwards. It is not possible to isolate the impact of cost escalation on the overall welfare outputs – however, our modelling suggests this has a minor impact.

Despite the shift in the allocation of benefits discussed above, the net result of our updated modelling is that GB wholesale prices are lower than those modelled at our IPA stage. This means that, irrespective of the impact of Greenlink, GB consumers are better off in the future modelled now relative to the future modelled at IPA stage. Interconnectors are therefore playing a different role in the energy system and we feel that the scope of our socio-economic modelling now captures a smaller proportion of Greenlink’s potential overall costs and benefits.

The supporting submissions from GIL discuss the qualitative and quantitative impacts of Greenlink on decarbonisation, flexibility, and security of supply in particular. GIL highlight that going forward both the GB market and Irish Single Energy Market (ISEM) are expected to have significant intermittency in their generation mix due to the growth of renewables. They suggest that Greenlink will be an essential source of flexibility between these markets which will improve renewable resource utilisation and facilitate their growth. Furthermore, as a result of this intermittency, GIL argue that the project will provide additional benefits through intraday markets, which is not captured in our day-ahead market modelling.

We have considered a range of wider evidence, including assessing the additional submissions from Greenlink, in reaching our decision. We note that recent Government studies published alongside the Energy White Paper⁷ highlight the positive role that interconnectors play in decarbonisation⁸ and flexibility⁹. Whilst these studies consider GB

⁷ Energy white paper: Powering our net zero future - <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

⁸ Impact of interconnectors on decarbonisation - <https://www.gov.uk/government/publications/impact-of-interconnectors-on-decarbonisation>

⁹ Modelling 2050: electricity system analysis - <https://www.gov.uk/government/publications/modelling-2050-electricity-system-analysis>

interconnectors as a whole, their outcomes provide useful context for Greenlink. We are also considering these aspects further through our interconnector policy review.

On balance of the factors discussed above, it is our view that Greenlink will likely continue to have an overall positive impact on current and future consumers in GB. On this basis we have decided that Greenlink should retain its cap and floor regime in principle.

We consulted with Greenlink on the outputs of the socio-economic modelling exercise and our interpretation prior to taking this decision. We consider this as a sufficient level of consultation given Greenlink's circumstances, however we will continue to consider consultation requirements for similar decisions in the future based on project-specific context.

Basis of our decision to extend the connection date requirement

To be eligible for assessment in Window 1, projects required a connection date by the end of 2020, and we then set the cap and floor regime start date for Window 1 projects as 1 January 2021 (or earlier where applicable).

The IPA conditions for both Greenlink and other Window 1 projects note that we may revisit the needs case *"if any information given to us before making our FPA decision leads us to consider that the basis of our IPA decision has materially changed."* We specified that with respect to project delays *"material changes would include any prospective delays in project delivery of more than 24 months"*, which means a connection date beyond the end of 2022. Subsequently in our cap and floor Window 1 update letter in June 2017, we recognised that there are a number of external pressures on the delivery of interconnector projects and extended the period of delay that we would not deem material by a further year, extending the backstop connection date for the purposes of this IPA condition to the end of 2023.

At the time of our decision to review the Greenlink needs case on the basis of cost escalation, to the best of our knowledge the project was on track to connect by end of 2023, although we had noted that there was a risk that this would not be possible. Since that decision we have become aware that Greenlink now intends to connect in 2024, thereby failing to satisfy the IPA condition.

As a review of the needs case was already underway, we decided that no further immediate action was required. We did note, however, that in the case of a positive needs case outcome, it would not be appropriate to hold Greenlink to an IPA condition that we know

could not be met. Following our updated assessment, we have therefore decided to extend the connection deadline IPA condition for Greenlink by two years to the end of 2025.

Our IPA conditions apply where *“any information given to us before making our FPA decision leads us to consider that the basis of our IPA decision has materially changed.”* At the FPA stage we confirm the cap and floor regime for the project being assessed and set preliminary cap and floor levels. For Greenlink we will be setting cap and floor levels once the project has sufficient clarity on the appropriate financial parameters to be used at their Final Investment Decision (FID).

For Greenlink this updated condition therefore means that we would expect evidence to be submitted to us prior to FID that reflects project delivery before the end of 2025 in line with the amended connection deadline condition. If this condition cannot be met we will consider the appropriate course of action at that time, based on the relevant circumstances.

Next steps

We now expect Greenlink to progress through the FPA process towards FID and contract award.

If you have any questions on the content of this letter, please contact Andrew Bullimore at cap.floor@ofgem.gov.uk.

Kind regards,

A handwritten signature in black ink, appearing to read 'RB' followed by a stylized flourish.

Rebecca Barnett

Deputy Director, Offshore Networks and Low Carbon RAB